



*From “Wetland Program Development Grants (WPDGs) Case Studies”  
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**Hualapai Department of Natural Resources (HDNR):** *Monitoring Hualapai wetlands  
and fostering partnerships to help guide management plans and restoration activities*

**Introduction**

The Hualapai Tribe resides on roughly a million acres of land adjacent to the Colorado River and the Grand Canyon and encompassing part of three Arizona counties: Coconino, Mohave and Yavapai. The reservation’s landscape is diverse, with forests, rolling hills, mesas, cliffs, gorges and wetlands. There are 956 acres of wetlands within the reservation, and impacts from cattle, feral animals and sediment deposition are constant threats. In order to address these issues most effectively, the Hualapai Tribe began a program to identify and monitor all significant wetlands on the reservation. Oversight, permitting and enforcement in the wetland program are primarily handled by the Hualapai Tribal Council, Hualapai Tribal Environmental Review Resources and the Hualapai Wildlife Conservation Program. The Hualapai Department of Natural Resources (HDNR), which includes Water Resources, Agricultural, and the Wildlife, Fisheries and Parks Programs, takes the lead in on-the-ground protection measures and monitoring. The tribe also coordinates with several other state and federal agencies that have been active in constructing fences, silt traps and water catchments and removing feral animals to counteract effects on wetland resources.

**WPDG Activity**

From 1998 to 2004, with support from WPDGs, HDNR began a bio-monitoring program to assess water quality, vegetation, invertebrates, fish and birds on 18 wetlands on the reservation. Initial monitoring efforts began in the early 1990s with landscape level assessments that helped supplement National Wetland Inventory (NWI) data and determine wetland quantity in the reservation. More recent projects focused on Levels 2 and 3 assessments that use various field methods to determine wetland condition and relative health.

The Hualapai Tribe’s wetland monitoring program had three primary objectives:

- To establish a data base for use in understanding impacts of land use activities on wetland resources;
- To understand the impacts of natural climatic variation, such as drought, on wetland communities; and
- To understand the effects of wetland restoration projects on the wetland resource.

These objectives guided research priorities and management decisions.

Assessment results indicated that water quality was most significantly affected by the presence of cattle, with high nitrate levels reported in those areas. In order to remedy this problem, HDNR installed fences to keep cattle away from wetland areas. The study also

reported a general decrease in vegetation coverage and diversity over the 6-year period, and this was likely attributed to a prolonged drought. HDNR sampled fish at one wetland and they seemed to increase in number over that same time period. Bird surveys in one of the wetlands identified common species and similar abundance patterns from 2003 to 2004. Macroinvertebrate assemblages were highly variable and generally site specific, so additional research will be necessary to better understand factors affecting their abundance and diversity on Hualapai wetlands. HDNR will continue to monitor all parameters to establish a database that will incorporate natural variations in the populations and potential effects of land use practices. Results from the above study will also be added to a database for determining baseline conditions.



Macroinvertebrate sampling in one of the wetlands on the Hualapai reservation. Photo courtesy of the Hualapai Department of Natural Resources staff.

Monitoring efforts and subsequent implications help guide restoration and management decisions. For example, roughly 11 wetlands on the reservation have been protected and/or restored through removal of feral animals, fencing and planting of native vegetation.

### **Current Work and Future Plans**

HDNR was awarded a grant under the 2005 EPA Environmental Outcome Wetland Demonstration Pilot program which will help them implement their wetland monitoring program. They hope to enhance the bio-monitoring program through their continued documentation of wetland condition and implementation of a database to determine trends in biological health, especially as it relates to protection activities. With continue

support from state and federal partners, the Hualapai Tribe plans to carry out other aspects of their Comprehensive Wetland Strategy, which includes fencing any remaining feasible wetlands and management of the feral animal population where possible.

Please visit the Hualapai Department of Natural Resources website (<http://www.hualapai.org/>) for more information about the work being done for the long-term protection of wetlands and other natural resources on the Reservation.

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